

C A S E
OF A
F R A C T U R E
OF THE
S T E R N U M,

BY JOHN HALE,
SURGEON TO THE NEW FINSBURY DISPENSARY.

L O N D O N :
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John Hale Esq

from his oblig'd Friend,

The Author

ALTHO' Fractures of the Sternum are described by every writer on the accidents to which the bones are subject, yet they appear to have seldom occurred, even to the oldest practitioner. All those authors whom I have had an opportunity of consulting, very fully describe in what manner this accident may happen, and as fully prescribe the rules to be observed in the treatment of it. They seem, however, to have copied from each other, without adducing any proofs to corroborate their assertions. DU VERNEY, in his excellent Treatise on the Diseases of the Bones,

is the only writer (that I have met with) who enters fully and circumstantially into Fractures of this part, he mentions three cases which had occurred to him, two of which proved instantly fatal; and the third recovered, but the patient remained an invalid during the rest of his life. He likewise asserts, that all Fractures of the Sternum are to be regarded as mortal; “tho’ there have been patients whose constitutions have held out, and have been cured.” I can only regret that he gives no information where those cases are recorded.

The singularity of the following case, the unexpected favourable termination

mination of it, together with the solicitations of my friends, are the motives which induce me to have a few copies printed for their perusal.

My particular thanks are due to my worthy Friend and Colleague DR. SKEETE, and to MR. HAIGHTON, for their kind advice and assistance during the progress of the cure. They who are acquainted with the professional abilities of those Gentlemen, will rather approve my silence, than commend me for any further eulogium on their merits.

October, 1787.

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FRACTURED STERNUM.

JOHN OATES, aged 38, by trade a cabinet-maker, being in company with some friends at a Tavern, and drinking freely, a dispute arose, which terminated in blows, and he was unfortunately thrown down with such violence on the edge of a chair, as to cause a fracture of the Sternum, about four inches above the ensiform cartilage.

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Being carried home, a neighbouring Apothecary was sent for, who ordered some draughts to be taken, and a volatile liniment to embrocate the part. Symptoms, however, soon became alarming, great pain and difficulty in respiration, cough, and oppression on the lungs. These complaints were suffered to increase, without any means being used to alleviate them, for the space of one week. He often spoke with certainty of his breast being broken, and said he could “ feel the bones jar against each “ other.”

Obtaining no relief, and being positively told that his complaint was only a bruise, he dismissed his Apothecary, and applied to the NEW FINSBURY DISPENSARY, on *Tuesday*, the 23d *January*, 1737. He was immediately visited by DR. SKEETE
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and myself, with MR. HAIGHTON, who happened to call on me that morning. On examination, we perceived that a fracture had taken place as described above, but how much of the bone was depressed, or how deep the depression might be, we could not readily ascertain, owing to an inflammation which occupied the inferior and middle part of the Sternum, and which seemed hastily advancing to suppuration. His pulse was hard and full, the cough frequent, and attended with such distress and anxiety to the patient, that he said he should be perfectly well if the cough could be stopped; for at that time he could plainly feel the broken edges of the bone grate on each other, the irritation of which was almost insupportable, and prevented his taking any rest.

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He was immediately blooded to the quantity of sixteen ounces, which was much inflamed, a laxative mixture ordered to be taken occasionally, an emulsion of Sperm. Ceti, cum Sal. Nitri, and Tinct. Thebaic. every three hours; and every other means used to obviate the effects which we imagined would be the consequences of such an accident. On the day following, the pulse was rather softer, and the respiration not quite so laborious; ten ounces more of blood were taken from him, which had the same inflammatory appearance; the inflammation on the Sternum was more circumscribed, and evidently shewed that some pus was already formed. The laxative medicine was ordered to be repeated, and thirty drops of Tinct. Thebaic to be taken at night.

Symptoms

Symptoms continued much the same till Saturday, the 27th of January, when Mr. COOPER, Surgeon to Guy's Hospital, favoured me with his company, and was of opinion that the abscess on the Sternum should be immediately opened. About six ounces of pus were discharged. On passing my finger to the bottom of the wound, I expected to have discovered the broken portion of bone, but did not, probably owing to the parts having become thickened in consequence of the preceding inflammation. The fracture, however, was evident to one sense, though not to the other; for on the patient desiring us to place our ear on the wound, we could hear the edges of the bone grate on each other at every inspiration. The pulse being still full, it was thought necessary to draw six ounces more of blood. He had no rest this night, the

cough being incessant. On Sunday, the 28th, the countenance appeared much dejected, the skin hot, but the pulse calm; I ordered the opiate to be increased to seventy drops of Tinct. Thebaic, and applied a bandage, or rather a girt, (such as I use in fractures of the ribs, and which is made to buckle to what degree of tightness may be requisite) in hopes of being able to confine the motion of the Sternum, and thereby prevent the irritation which the fracture produced. I intended to have applied this bandage when I first visited him, but it was thought that if much pressure was thrown on the ribs, it might probably cause the inferior broken part of the bone to protrude through the inflamed integuments, and be productive of much danger; the bandage was therefore deferred till the abscess was opened, and the bone not being
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evident to the touch, we had less to fear from the application of a moderate pressure.

He experienced much relief in consequence of the bandage being applied, the cough was greatly abated, the opiate procured a sound sleep, and the bone was not troublesome in inspiration; the pulse was perfectly calm, and the wound discharged a healthy pus. He was now ordered some mutton broth, having hitherto been confined to water-gruel.

From this time to Monday the sixth of February, the symptoms indicated much danger; he sweated profusely, coughed incessantly, and what he expectorated was often tinged with blood. He took liberally of a decoction of Bark with Elixir of Vitriol, drank warm milk every morning, and used such nourishing articles of diet as
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were directed by DR. SKEETE. This plan seemed to succeed, for from the 6th to 12th of February, the sweats were much diminished, and the cough less frequent; but the wound discharged a foetid ichor in great abundance, which proceeded from a sinus extending above, and for some space round the superior part of the wound. We were now of opinion that this ichorous discharge might proceed from the edges of the broken bone, if so, it became advisable to make a further opening, to endeavour to reach the foundation of the mischief, and then pursue such a course as might be indicated from examining the condition of the parts.

This, however, was delayed till Saturday, the 17th of February, as for some days we pleased ourselves with the idea that the
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parts would unite independent of our interference, especially as the discharge from the wound became thicker ; (DR. SKEETE having added Gum Myrrh to the decoction of Bark) but we were unhappily disappointed in our expectations ; and as no time was to be lost, I informed him of the plan which (on consultation) we intended to follow, viz. to make an incision down to the bone, to examine its condition, and, if necessary, to remove whatever part of it might, in our opinion, be an obstacle to a perfect union. He readily assented to whatever might be judged expedient for his relief ; not on his own account, having suffered so much that life was become a burden, but for the sake of his wife and five infant children, whose subsistence depended solely on his labour. I made an incision from about an inch above the edge
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of the old wound, and continued it to the bottom, the knife grated on the bone, and the inferior part became evident to the touch, tho' covered externally with a smooth granulation. It now appeared that the fracture was not immediately on the centre of the Sternum, but more inclined to the right side of it; that portion to which the ribs are united was firmly attached to them, and in consequence of the incision, the fractured part had separated from its situation, and exposed the cavity of the mediastinum. I passed my finger into the cavity, and felt the parts *apparently* carious on each side. We now could only conjecture that a large exfoliation would ensue; but, in all probability, the consequence of this operation might prove fatal, either by the pus lodging in the cavity of the mediastinum, or by causing that irritation often consequent to the
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the exposure of cavities. Theory certainly justified us in these conclusions, but practice has happily convinced us that notwithstanding these discouragements, there was still a method left to prevent what we had so much reason to fear. The bone, tho' broken, was not denuded, both the superior and inferior portions were covered with granulations; it then became an object to endeavour to promote a union of those parts by incarnation, similar to what occurs in compound fractures, in which light it might now certainly be considered.

I must here observe, that on the day following, I found him much better, he became easier after the operation, coughed but little, and slept the greatest part of the night without taking the opiate; this was the first natural sleep he had enjoyed since

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the accident happened, for the opiates only served to palliate the cough, without procuring any refreshing sleep, altho' he generally took one hundred drops of Tinct. Thebaic; the expectoration also appeared more frothy, and he had no difficulty in discharging it from the lungs. This amendment was but temporary, for from the 17th to the 24th of February, the opiates were again obliged to be given. Our attempts to procure a union of the parts proved abortive, and the inferior edge of the bone protruded through the wound at every inspiration, and consequently exposed the cavity of the mediastinum. There seemed no prospect of any exfoliation, I therefore omitted the former bandage, as it appeared to have no power to answer the intention we had in view, and passed a common roller round the inferior part of the Sternum; the

the pressure of this brought the lower portion in contact with the upper, and we had the pleasure of seeing a union effected in a few days. The sweats from this time totally ceased, and the cough was not troublesome. I removed him to Islington, for the benefit of the air, there the cough entirely left him, and he slept without taking the opiate.

When he attempted a deep inspiration, he felt a small pressure on the fractured part, and also on the right side of the wound ; which side was evidently enlarged, and felt as if the cartilages of the ribs had received some injury from the fall. He complained that the air was too sharp for him, and (to use his own expression) “ felt like vinegar in his nostrils ;” indeed this was so much the case, that if he stood at the

window when open, or attempted to walk out, the air instantly caused him to sneeze violently, which gave great pain to the fractured part. I was therefore obliged to remove him from Islington, where he only continued four days; and for two or three nights after he returned home, the cough again became violent, so that I was under the necessity of repeating the opiates. As the wound healed, the cough abated, and his only complaint was that of great weakness, and a total inability to use his arms with any freedom of motion. He could stoop to buckle his shoe, could take up any weight, but was utterly unable to perform any *lateral motion*.

March. During this month, he was perfectly free from complaint; had taken Pulv. Cort. Peruv. *3ss.* ter die. The
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enlargement related to have been on the right side of the wound was much lessened, but an abscess formed on that side immediately on the breast, which broke on Friday, the 30th of March. It appeared quite superficial, and to have had no connection with the original injury.

April. The wound on the Sternum was now healed to about the size of a six-pence, and from this a vast discharge was daily evacuated; suspecting some sinus, I passed the probe, and found one, which extended about two inches on the right side between the two inferior cartilages, directly above that enlargement already mentioned. This sinus was laid open, and continued discharging till the beginning of August, when it was proposed to apply a caustic on the part; the action of which laid bare the fractured

fractured portions of the bone, the superior edge greatly depressed, and the intermediate space filled with a kind of membranous substance, which had prevented an ossific union of the parts. It was now curious to observe the process which nature was daily executing, in order to fill up the vacuity; at every dressing some new excitement was perceived; increased vascularity * in the living portions of bone, by which the carious

* In order more fully to comprehend what I mean by an "increased vascularity," it is necessary to observe, that when the slough (which the action of the caustic had produced) was separated from the Sternum, a very large portion of the inferior part of the bone *appeared* to be entirely deprived of the living principle; but fortunately this was not the case; every day's inspection fully proved it, by that portion becoming more and more florid, and by the assistance of a glass, we could plainly discover new vessels shooting in a transverse direction through the osseous fibres. I therefore trust that the term of "increased vascularity," is not misapplied, and I am at a loss for any other to express my meaning more intelligibly.

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part became more separated, and granulations arising from the surrounding soft parts. On the 10th of October, the exfoliation from the inferior part took place, the portion of bone was but small, healthy granulations being substituted in its place.

We now assisted him with an elastic truss, which proved of so much service as to enable him again to follow his business of a cabinet-maker. This truss makes an equal pressure on each side of the breast, and supports the sternum in such a manner, that if he takes it off, he says, he feels "as if his inside was falling in pieces." Without it, he is incapable of performing any lateral motion.

The wound now healed, without any interruption, and was perfectly cicatrized on the 23d of October.

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The following observations are such as will naturally suggest themselves on an attentive consideration of the above facts.

First, That the case was attended with considerable danger, throughout the greater part of its progress; but from very different, and even opposite circumstances, at different periods. In the beginning, the symptoms of inflammation in the Thorax seemed to be so general and violent, that without the free use of the lancet, assisted by dilution and the antiphlogistic regimen, it is probable that a fatal termination would speedily have ensued; but the only method by which this could be prevented, doubtless assisted in inducing that state of debility and hectic under which the patient was afterwards in danger of sinking, and which required the liberal exhibition of Bark, Elixir of Vitriol, Myrrh,

Myrrh, and such nourishing articles of diet as were judiciously prescribed by Dr. Skeete. The same thing happens in many cases of disease which fall under the care of the Surgeon ; and the present instance is a strong illustration of the necessity of a particular attention being required to the state of the constitution, as well as to the condition of the diseased part.

Secondly, It may appear extraordinary, that notwithstanding the frequent exposure of the cavity of the Mediastinum, which seemed to take place when the broken edges of the bone were separated, during the alternate motions of inspiration and expiration, that this exposure was not followed by any repeated attack of inflammation, or by any effusion of pus into the cavities of the Thorax, tho' we had more than once sufficient reasons to apprehend such effects,

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especially when the expectoration assumed a purulent and bloody appearance, with symptoms of hectic. The event therefore seems to prove that such adhesions must have taken place between the Lungs and Pleura in the neighbourhood of the injured part, as completely to have prevented any such effect.

Thirdly, After some months, the treatment was almost entirely confined to the part; the healing of the wound being prevented by the state of the bone underneath, as has been already mentioned.

Fourthly, That the loss of substance which the Sternum has sustained, is at present supplied by granulation only; and whether nature will in this case, as in many others, restore the part to its original state, by a bony deposition, time alone will be able to discover.

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P O S T S C R I P T.

SINCE the foregoing sheets came from the press, I have read an account of a Fractured Sternum, in the EDINBURGH MEDICAL COMMENTARIES, Vol. IV. p. 185, by Mr. George Borthwick, Surgeon to the 14th regiment of Dragoons. In many instances the symptoms agreed with those mentioned in my case, particularly the grating noise in the time of respiration. Mr. Borthwick being immediately called in, prevented that train of dangerous symptoms which unfortunately befel my patient. The account being drawn up with great precision, I refer my reader to the book itself for further information.

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The addition of this Postscript affords me an opportunity of saying, that my patient called on me at the Dispensary, on the 30th ult. and informed me that he had gained so much strength within a few days, as to be enabled to perform the most laborious part of his work, without the assistance of the truss.

November, 1787.